# 2.4GHz RF Modular Transceiver System Installation manual (draft v1)

## **1.** Description

This document describes an RF transceiver module PCB having two independent radio transceivers. One radio complies to IEEE 802.11b/g protocols and the other to the Bluetooth Low Energy specification. The module provided on-board power regulation and full shielding for the radio transceivers.

2.

The module consists of 2 separate circuits:

- 1) A 2.4GHz Wi-Fi RF transceiver IC and two PIF etch antennas.
- 2) A 2.4GHz Bluetooth Low Energy transceiver IC and one PIF etch antennas.

#### **3.** Cautions:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by Bose Corporation could void the user's authority to operate this equipment.

WARNING! This module is to be installed only by Bose Corporation in its end products, and shall not be marketed to any other party.

This RF Module has been certified for integration into products without further certification. However, Bose Corporation is still responsible for testing its end products for any additional compliance requirements required with this module installed (such as digital device emissions, PC peripheral requirements, etc.).

### **End Product Labeling**

This module is labeled with its own FCC ID and IC Certification Number. If the label is not visible when the module is installed inside another device, then the outside of the device into which this module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains Transmitter Module FCC ID: A94412568"

"Contains Transmitter Module IC: 3232A-412568"

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"Contains FCC ID: A94412568"
"Contains IC: 3232A-412568"

**IMPORTANT NOTE:** In the event that these conditions can not be met (for certain configurations or collocation with another transmitter), then the FCC and Industry Canada authorizations are no longer considered valid and the FCC ID and IC Certification Number can not be used on the final product. In that case the end product must be re-evaluated to obtain separate FCC and Industry Canada authorizations.

In addition, Information regarding how to install or remove this RF module or change its RF related parameters should not be provided to the end user.

# The user manual for the end product must include the following information in a prominent location:

"To comply with FCC and Industry Canada RF radiation exposure limits for general population/uncontrolled exposure, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and all persons at all times. In addition this transmitter must not be collocated or operating in conjunction with any other antenna or transmitter."

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur)

approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

## **4.** Markings

4.1 This module shall be identified with the following ID numbers on the radio shields.

FCC ID: A94412568 IC: 3232A-412568

# 4.2 End Product Labeling

The final end product which this module is used in must be labeled in a visible area with the following:

"Contains FCC ID: A94412568 / IC:3232A-412568"

# **5.** Connections

The following tables describe the connections to the module made via the four connectors.

Pin #         Name         Signal Name           31         Ethernet         GND           30         Ethernet         TXP           29         Ethernet         TXN           28         Ethernet         LCMT           27         Ethernet         RXP           26         Ethernet         RXN           25         Ethernet         GND           24         Ethernet         SPD_LED_AN           22         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USBO_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_DN           14         USB         USBO_DM           12         USB         USBO_DD           11         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_RETURN	J1201	Group	
30         Ethernet         TXP           29         Ethernet         TXN           28         Ethernet         LCMT           27         Ethernet         RXP           26         Ethernet         RXN           25         Ethernet         GND           24         Ethernet         SPD_LED_AN           23         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USBO_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RETURN	Pin#	Name	Signal Name
29         Ethernet         TXN           28         Ethernet         LCMT           27         Ethernet         RXP           26         Ethernet         RXN           25         Ethernet         GND           24         Ethernet         SPD_LED_AN           23         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USBO_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RETURN           5 <td>31</td> <td>Ethernet</td> <td>GND</td>	31	Ethernet	GND
28         Ethernet         LCMT           27         Ethernet         RXP           26         Ethernet         RXN           25         Ethernet         GND           24         Ethernet         GND           24         Ethernet         SPD_LED_AN           23         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USB0_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         USBO_DM           12         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RETURN           5	30	Ethernet	TXP
27         Ethernet         RXP           26         Ethernet         RXN           25         Ethernet         GND           24         Ethernet         GND           24         Ethernet         SPD_LED_AN           23         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USB0_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4<	29	Ethernet	TXN
26         Ethernet         RXN           25         Ethernet         GND           24         Ethernet         (+)3.3V_ET           23         Ethernet         SPD_LED_AN           22         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_CA           20         Ethernet         LKACT_LED_CA           19         USB         USB0_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         TAP_IN           3         AUX/TAP         TAP_IN <t< td=""><td>28</td><td>Ethernet</td><td>LCMT</td></t<>	28	Ethernet	LCMT
25         Ethernet         GND           24         Ethernet         (+)3.3V_ET           23         Ethernet         SPD_LED_AN           22         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USB0_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         TAP_IN           3         AUX/TAP         TAP_IN           4         AUX/TAP         TAP_OUT	27	Ethernet	RXP
24         Ethernet         (+)3.3V_ET           23         Ethernet         SPD_LED_AN           22         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USB0_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	26	Ethernet	RXN
23         Ethernet         SPD_LED_AN           22         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USB0_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	25	Ethernet	GND
22         Ethernet         SPD_LED_CA           21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USB0_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USB0_DRVVBUS           15         USB         USB0_ID           14         USB         GND           13         USB         USB0_DM           12         USB         USB0_DP           11         USB         GND           10         USB         USB0_VBUS           9         USB         USB0_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	24	Ethernet	(+)3.3V_ET
21         Ethernet         LKACT_LED_AN           20         Ethernet         LKACT_LED_CA           19         USB         USB0_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USB0_DRVVBUS           15         USB         USB0_ID           14         USB         GND           13         USB         USB0_DM           12         USB         USB0_DP           11         USB         GND           10         USB         USB0_VBUS           9         USB         USB0_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	23	Ethernet	SPD_LED_AN
20         Ethernet         LKACT_LED_CA           19         USB         USB0_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USB0_DRVVBUS           15         USB         USB0_ID           14         USB         GND           13         USB         USB0_DM           12         USB         USB0_DP           11         USB         GND           10         USB         USB0_VBUS           9         USB         USB0_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	22	Ethernet	SPD_LED_CA
19         USB         USBO_5V_FAULT_L           18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	21	Ethernet	LKACT_LED_AN
18         USB         MICROB_DET           17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	20	Ethernet	LKACT_LED_CA
17         USB         MICROB_SEL           16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	19	USB	USB0_5V_FAULT_L
16         USB         USBO_DRVVBUS           15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	18	USB	MICROB_DET
15         USB         USBO_ID           14         USB         GND           13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	17	USB	MICROB_SEL
14         USB         GND           13         USB         USB0_DM           12         USB         USB0_DP           11         USB         GND           10         USB         USB0_VBUS           9         USB         USB0_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	16	USB	USB0_DRVVBUS
13         USB         USBO_DM           12         USB         USBO_DP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	15	USB	USB0_ID
12         USB         USB_DDP           11         USB         GND           10         USB         USBO_VBUS           9         USB         USBO_VBUS           8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	14	USB	GND
11 USB GND 10 USB USB0_VBUS 9 USB USB0_VBUS 8 USB GND 7 AUX/TAP AUX_LEFT 6 AUX/TAP AUX_RETURN 5 AUX/TAP AUX_RIGHT 4 AUX/TAP GND 3 AUX/TAP TAP_IN 2 AUX/TAP TAP_OUT	13	USB	USB0_DM
10	12	USB	USB0_DP
9 USB USBO_VBUS 8 USB GND 7 AUX/TAP AUX_LEFT 6 AUX/TAP AUX_RETURN 5 AUX/TAP AUX_RIGHT 4 AUX/TAP GND 3 AUX/TAP TAP_IN 2 AUX/TAP TAP_OUT	11	USB	GND
8         USB         GND           7         AUX/TAP         AUX_LEFT           6         AUX/TAP         AUX_RETURN           5         AUX/TAP         AUX_RIGHT           4         AUX/TAP         GND           3         AUX/TAP         TAP_IN           2         AUX/TAP         TAP_OUT	10	USB	USB0_VBUS
7	9	USB	USB0_VBUS
6 AUX/TAP AUX_RETURN 5 AUX/TAP AUX_RIGHT 4 AUX/TAP GND 3 AUX/TAP TAP_IN 2 AUX/TAP TAP_OUT	-	USB	GND
5 AUX/TAP AUX_RIGHT 4 AUX/TAP GND 3 AUX/TAP TAP_IN 2 AUX/TAP TAP_OUT	7	AUX/TAP	AUX_LEFT
4 AUX/TAP GND 3 AUX/TAP TAP_IN 2 AUX/TAP TAP_OUT	6	AUX/TAP	AUX_RETURN
3 AUX/TAP TAP_IN 2 AUX/TAP TAP_OUT	5		AUX_RIGHT
2 AUX/TAP TAP_OUT			GND
		AUX/TAP	TAP_IN
		AUX/TAP	TAP_OUT
1 AUX/TAP GND	1	AUX/TAP	GND

J1200 Pin #	Group Name	Signal Name
10	Ground	GND
9	Button	STROBE0
8	Button	STROBE1
7	Button	STROBE2
6	Button	SWITCHIN0
5	Button	SWITCHIN1
4	Button	SWITCHIN2
3	Ground	GND
	Button	
2	Sense	STATICIN
1	Ground	GND

T1202		Т
J1203 Pin #	Cuoun Nome	Signal Name
1	Group Name Audio Out	Signal Name AIC3256LRET\BASE
2	Audio Out	AIC3256LOUT
3	Audio Out Audio Out	AIC3256RRET
4	Audio Out	AIC3256ROUT
5	Audio Out Audio Out	EXTDACLRET
6	Audio Out Audio Out	EXTDACLACT
7	Audio Out Audio Out	EXTDACLOUT
8	Audio Out	EXTDACRET
9	Audio Control	
10	Audio Control	MUTEOUTN AMPSTBYN
11	Audio Control	AMPFAULTN
	Audio Control	AUDOUTBCLK (R1200)
13	SMPS, PA sync	GND
14	SMPS, PA sync	AUDIO_SYNC_OUT (R1208)
15	Monitor Inputs	IDIN
16	Monitor Inputs	PAOFFSET1
17	Monitor Inputs	PAOFFSET2
18	Monitor Inputs	PWRMON
19	Monitor Inputs	THERMISTOR
20	Audio Power	+5VA
21	Smartspeaker	UART0_RXD/IR_IN_T
22	GND	GND
23	Smartspeaker	UART0_TXD
24	User Interface	LED0
25	User Interface	LED1
26	GND	GND
27	Misc	I2C0_SCL
28	GND	GND
29	Misc	I2C0_SDA
30	Misc	STATICIN
31	Misc	BATT_CHG_EN_L
32	Misc	DC_PRESENT_L
33	Power	PGND
34	Power	PPOS
35	Power	PGND
36	Power	PPOS
37	Power	PGND
38	Power	PPOS
39	Power	PGND
40	Power	PPOS
1	1	<u> </u>

J1202 Pin #	Group Name	Group Name
12	GND	GND
11	LED	LED0
10	LED	LED1
9	OLED Power	OLED_17V
8	IR_RECEIVER	UART0_RXD/IR_IN
7	Anode + Power	LED_5V
6	OLED Control	DISPCEN
5	OLED Control	DISPRESN
4	OLED Control	DISPDCN
3	OLED Control	SP1_SCLK
2	OLED Control	SPI2_DO
1	GND	GND

# **6.** General Electrical specifications

6.1 Power supply 5.0V + -5%

6.2 Power consumption <5 Watts

6.3 Operational Temperature  $0 \sim 45 \text{ C (non-condensing)}$ 

### 7. 2.4GHz BTLE RF Transceiver

The RF transceiver uses a TI CC2540 low cost, low power RF transceiver IC to drive a 50 ohm etch antenna via a simple balun and matching network. A switched coaxial connector is provided for test purpose to measure the output power from the IC and balun

## 7.1 Electrical Specification

For a detailed description of the CC2540 and the most recent electrical specification see the full vendor part spec SWRS084E available on TI web site: <a href="http://www.ti.com/lit/ds/swrs084e/swrs084e.pdf">http://www.ti.com/lit/ds/swrs084e/swrs084e.pdf</a>

The module shall use the following settings:

7.1.1 RF Output Power: +4dBm typical (measured at J801)

7.1.2 Useable Frequency Range: 2401.67 – 2482 MHz

7.1.3 Modulation <1 Mb/sec GFSK with data

whitening

7.1.4 Channel Spacing 2 MHz

## 7.2 2.4GHz 802.11b/g RF Transceiver

The transceiver uses a proprietary and confidential chip set from SMSC corporation for control and implementation of the IEEE 802.11b/g radio. A DM870 control chip implements the transmission protocol and feeds I-Q information to the company's T6201C RF transceiver. For transmit, the RF path includes a power amplifier SST12LP15A from Microchip.

The module shall use the following settings:

7.2.1 RF output power: +11dBm typical (measured at CON4)

7.2.2 Useable frequency range: 2412 – 2462MHz (Western Hemisphere)

7.2.3 Modulation: OFDM

7.2.4 Channel spacing: 5 MHz

## 7.3 Antenna Specification

The RF module uses three Planar Inverted F etch antennas, two in switched diversity mode for Wi-Fi and one for Bluetooth Low Energy. The PCB layout capture below shows their relative locations. The overall board dimensions are 225mm long by 37mm wide.

BTLE antenna Wi-Fi antennas

